# ART 1/2 MODIFICATION NOTE 2
## (for Electronics Technicians)

| | | |
|---|---|---|
| SUBJECT | : | Replacement of Relay Bracket Assembly in the R/ACU |
| PURPOSE | : | To increase the reliability of the ART system |
| EQUIPMENT AFFECTED | : | All ART systems installed prior to January 1985 |
| PARTS PROVIDED | : | 1 - Relay Bracket Assembly, Servo P/N 400072-89<br>1 - Relay Bracket Cover<br>3 - 8-32 x 1/4" FH Screws |
| MOD PROCUREMENT | : | The required components will be mailed to each station |
| SPECIAL TOOLS REQUIRED | : | None |
| TEST EQUIPMENT REQUIRED | : | Digital Voltmeter<br>12 Vdc Power Supply |
| TIME REQUIRED | : | 5 Work hours |

General:

The overall reliability of the ART system is enhanced by the installation of this improved relay bracket assembly, which provides a heavy duty replacement for J170-1A3A1K3 and increases the voltage breakdown properties of all six relays by mounting them on an insulated surface.

I. Removing Relay Bracket From R/ACU.

CAUTION

Remove electrical power from R/ACU to prevent transients which could damage system components.

A. Remove R/ACU 1A3A1 from Pedestal Assembly (for detailed illustrations refer to the System Manual).

1. On R/ACU 1A3A1, position SYSTEM POWER switch to OFF.

2. Loosen 12 captive screws 1A3A1A5H100 through 1A3A1A5H111 and pull R/ACU 1A3A1 out of pedestal assembly until slide stops are engaged.

3. Remove connectors 1A3P1 through 1A3P3 and cable assemblies W11, W12, W13 and W14 from connectors 1A3A1W4J1, 1A3A1W3J2 through 1A3A1W3J7 at R/ACU 1A3A1.

4. Release slide locks and remove R/ACU 1A3A1 from pedestal assembly.

8. With R/ACU on the work bench, remove power supplies PS3 and PS4, Figure 1.

1. Remove two power supply mounting screws from base of each power supply.

2. Lift power supplies out.

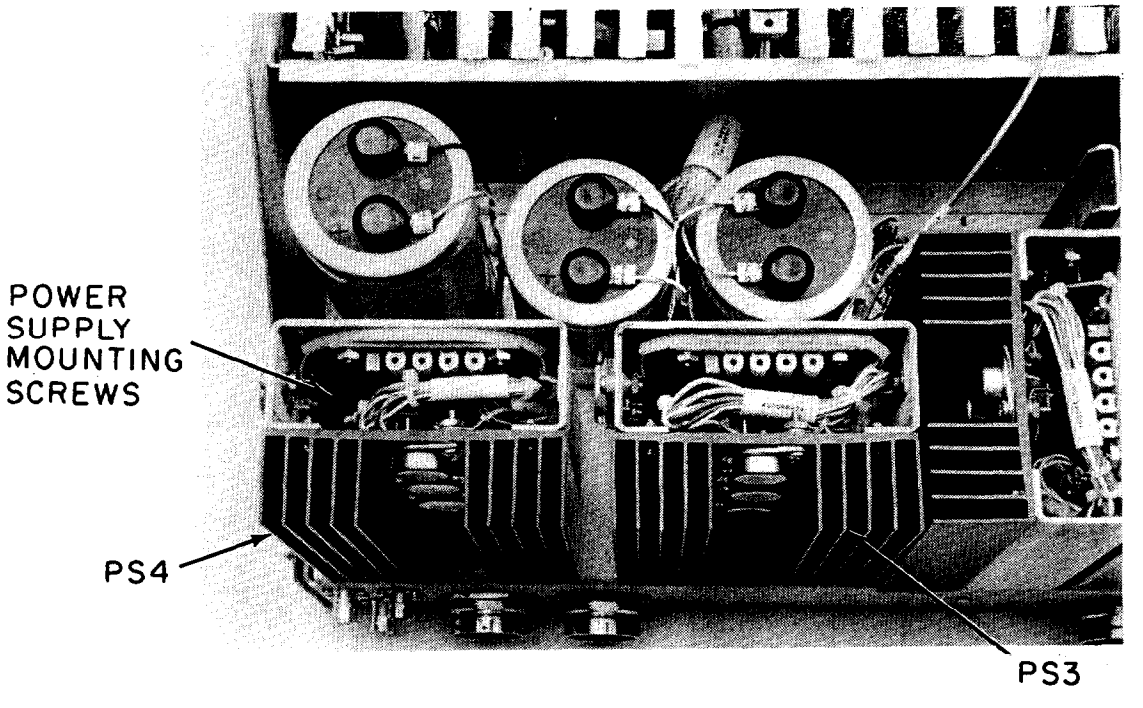



FIGURE 1

C. Remove capacitors C2, C3, and C4, Figure 2.

1. Remove capacitor terminal caps.

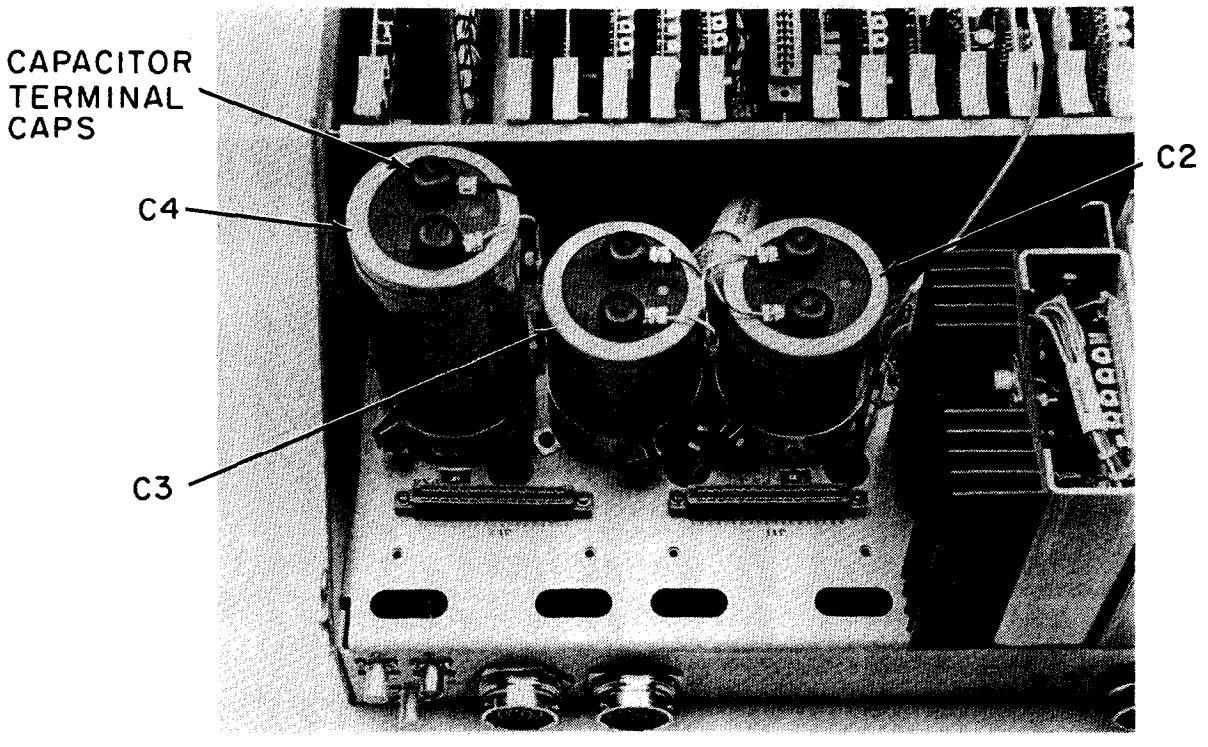



FIGURE 2

2. Tag and remove leads to terminals, Figure 3.
3. Loosen capacitor clamps.
4. Lift out capacitors C2, C3 and C4.

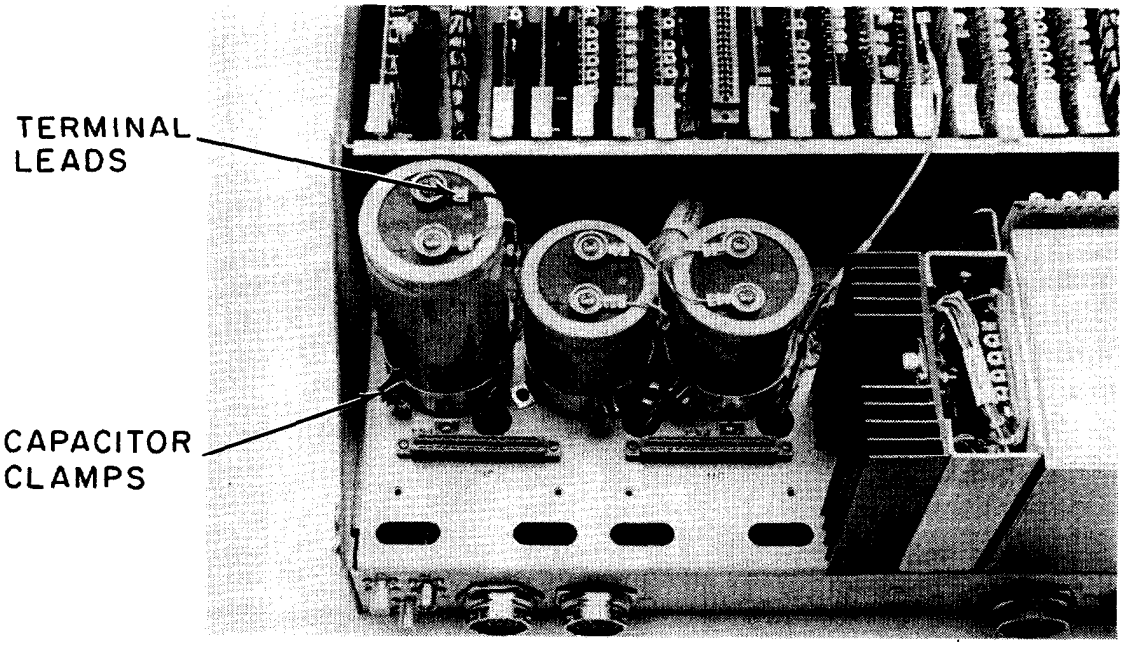



FIGURE 3

D. Remove relay bracket assembly with relays.

1. Remove three relay bracket mounting screws, Figure 4.

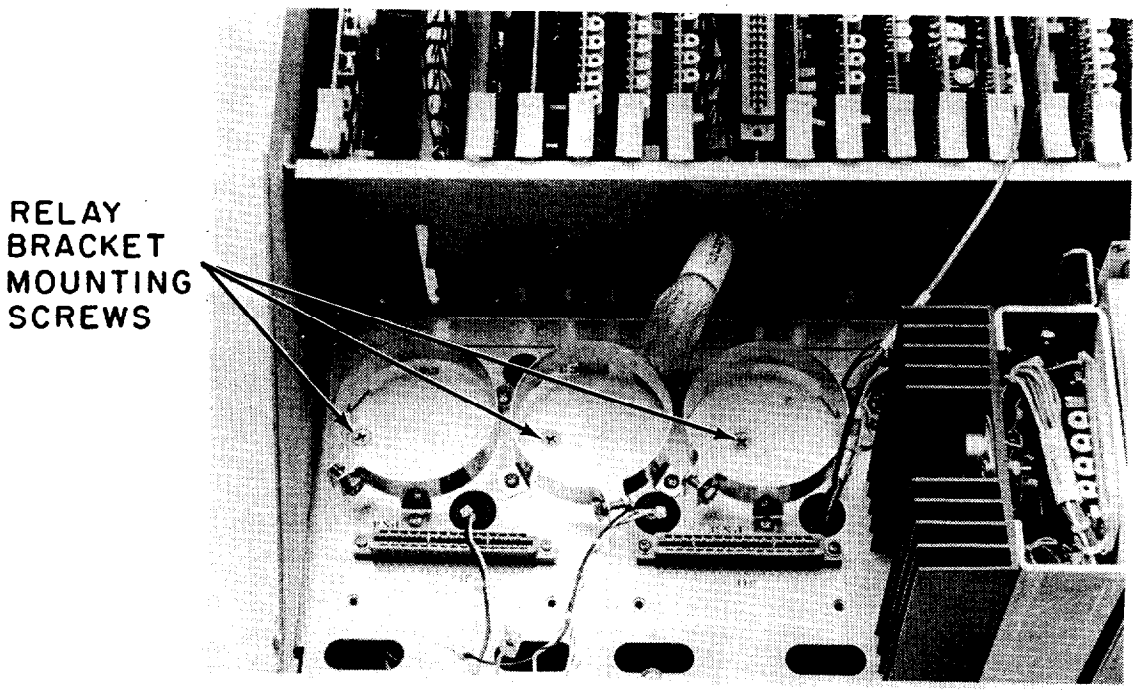



FIGURE 4

2. Remove three relay bracket cover mounting screws and relay bracket cover, Figure 5.

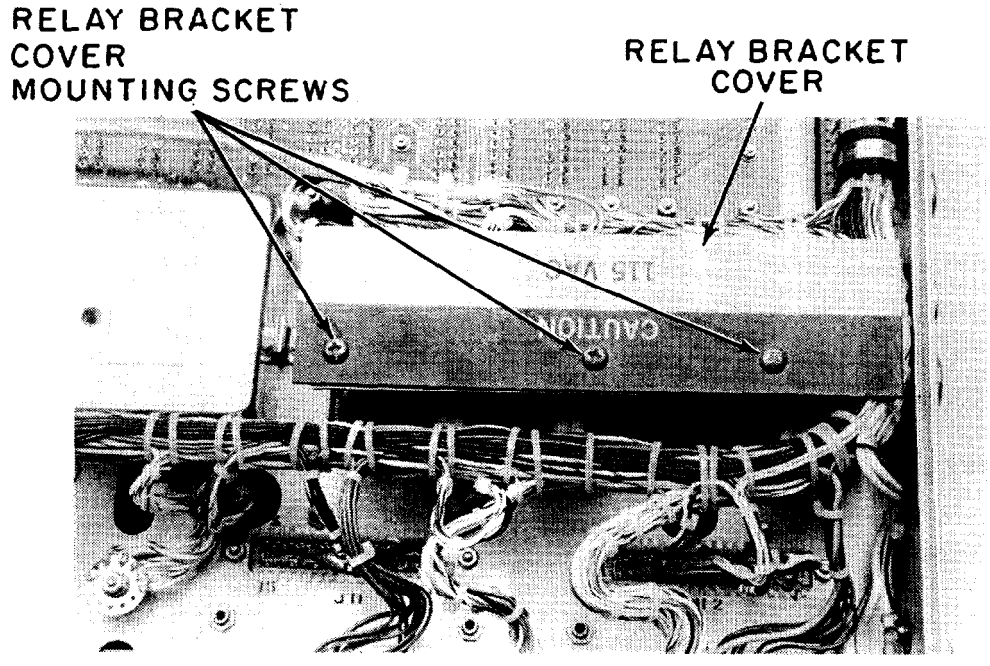



FIGURE 5

3. Fold back relay bracket with relays, Figure 6. Clip leads as close to relay terminals as possible. Avoid damaging relay terminals.

4. Remove relay bracket with relays.

5. Return relays and bracket to Servo Corporation in packing provided with new relay assembly. Return postage has been provided.

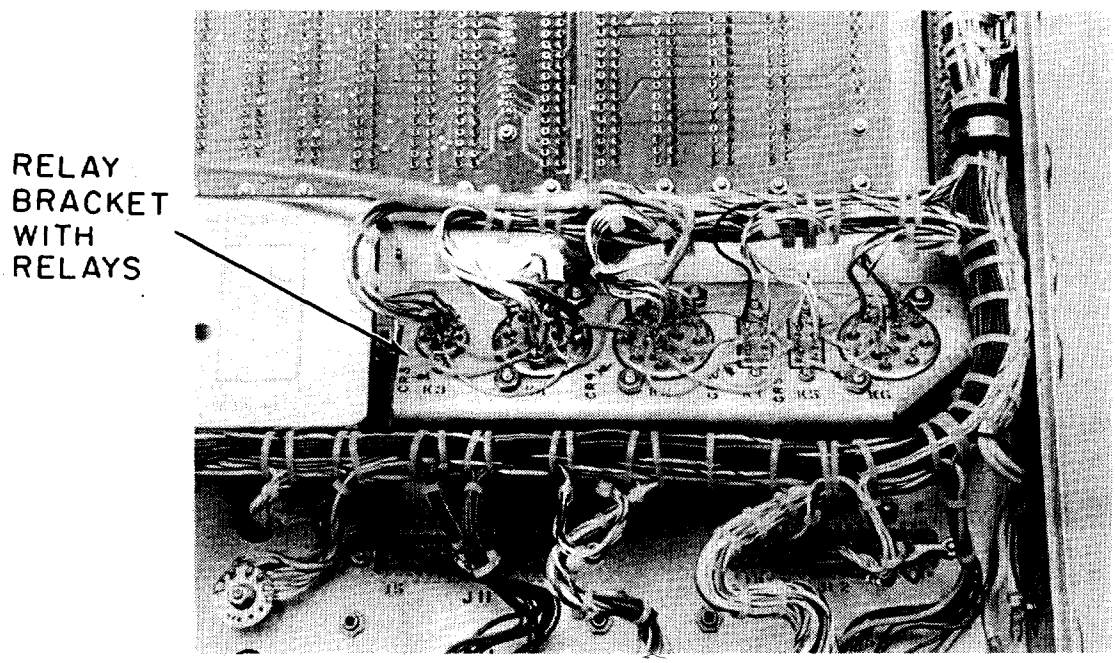



FIGURE 6

II. Installing Replacement Relay Bracket Assembly.

A. Strip insulation (approximately 1/2 inch) from ends of relay leads, and tin ends.

CAUTION

Diodes CR2-5 on relays K1, K3, K4 and K5 are silicon type. Normal soldering to terminals to which they are connected may be done without special heat sinks; however, excessive heat at these terminals should be avoided.

B. Solder leads to relay terminals as shown in Figure 7 and wiring diagram Figure 8.

CAUTION

The relay pins are not numbered. Be very careful.

1. Place new relay bracket assembly into position, Figure 7.

2. Where one lead goes to a terminal, wrap once and solder.

3. Where two leads go to the same terminal, wrap the second lead around the base of the terminal and solder.

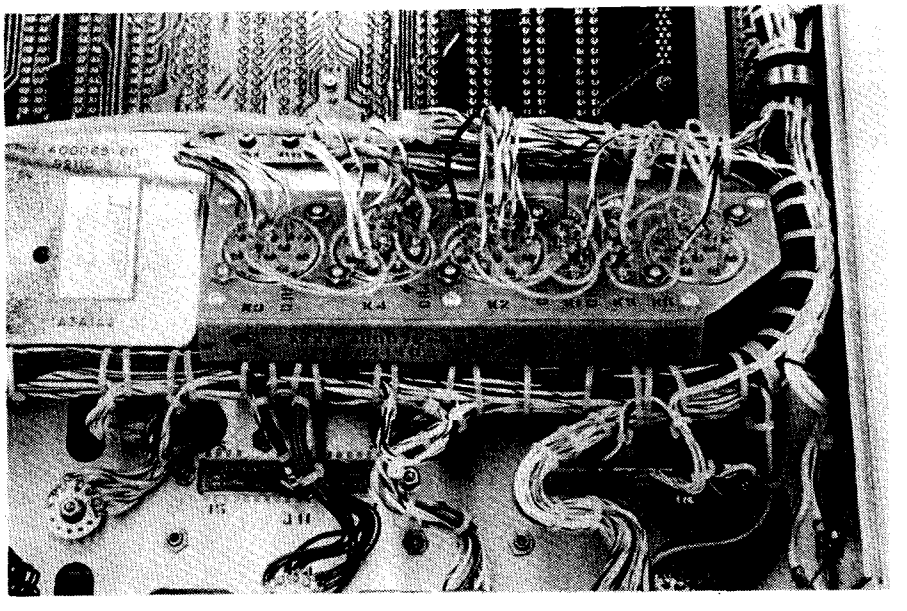


FIGURE 7

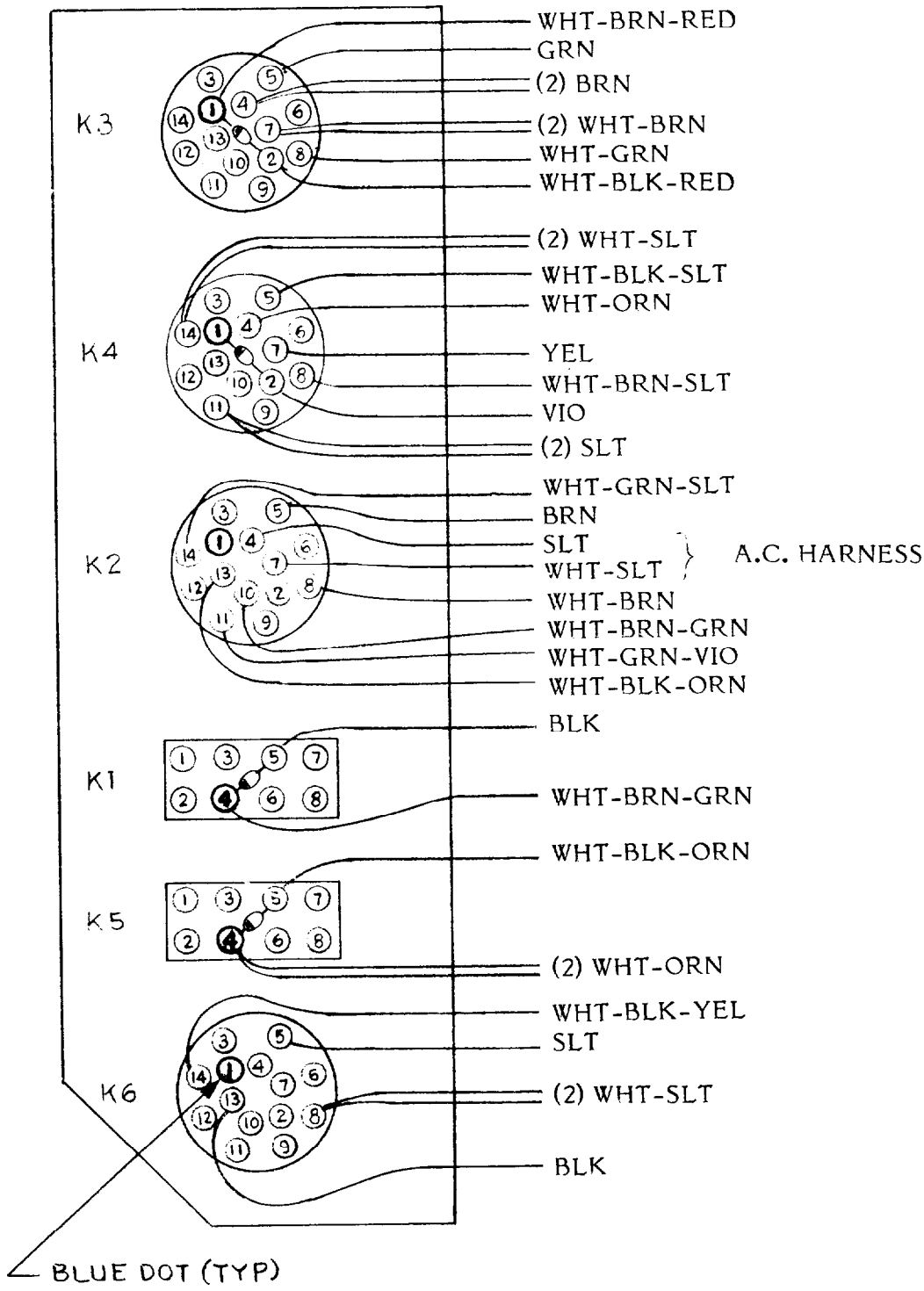

K3
K4
K2
K1
K5
K6
WHT-BRN-RED
GRN
(2) BRN
(2) WHT-BRN
WHT-GRN
WHT-BLK-RED
(2) WHT-SLT
WHT-BLK-SLT
WHT-ORN
YEL
WHT-BRN-SLT
VIO
(2) SLT
WHT-GRN-SLT
BRN
SLT
WHT-SLT
A.C. HARNESS
WHT-BRN
WHT-BRN-GRN
WHT-GRN-VIO
WHT-BLK-ORN
BLK
WHT-BRN-GRN
WHT-BLK-ORN
(2) WHT-ORN
WHT-BLK-YEL
SLT
(2) WHT-SLT
BLK
BLUE DOT (TYP)

**FIGURE 8**

C. Perform inspection after completion of wiring modification.

1. Carefully check wiring to acertain that it is in accordance with wiring diagram (Figure 8). Verify that specified color coded wires are connected to the designated terminals.

2. Carefully inspect each solder joint and verify that:

a. There are no solder bridge shorts between terminals or case.

b. There are no "cold solder joints" which can lead to intermittent operation.

A good solder joint displays a shiny surface with minimum solder build up and a smooth contoured flow around the wire surface and terminal.

D. Install relay panel assembly and secure with three relay bracket mounting screws, Figure 4.

E. Install replacement bracket assembly cover with screws provided, Figure 9.

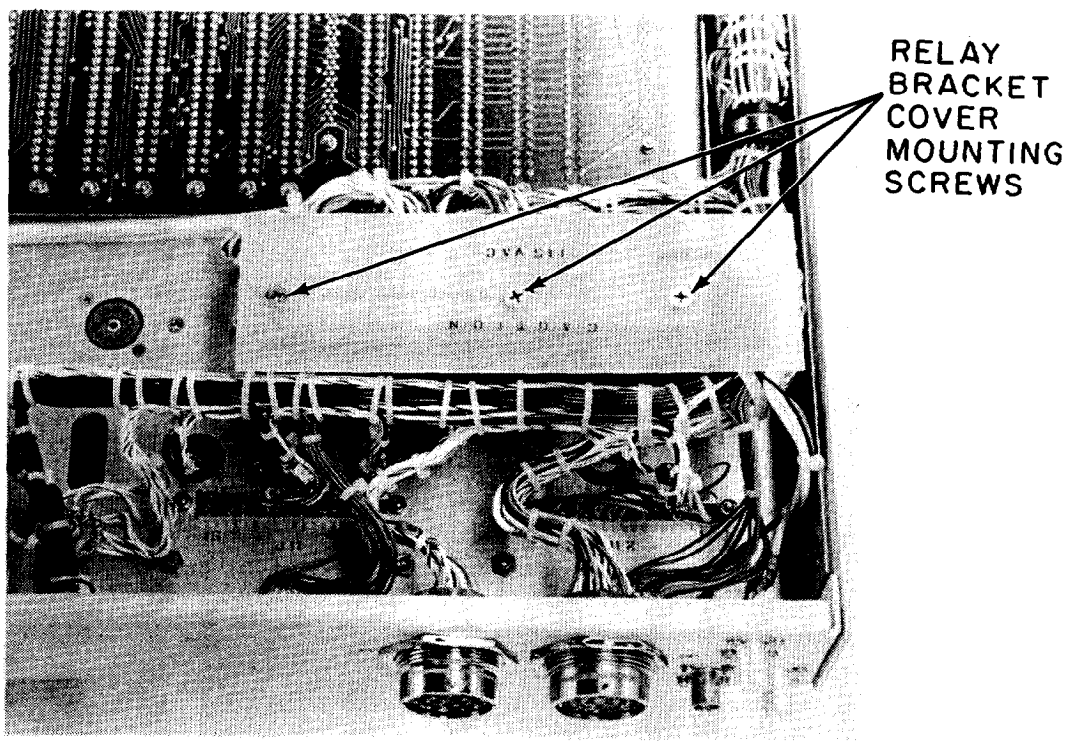



FIGURE 9

F. Install capacitors C2, C3 and C4.

1. Place capacitors into their respective clamps and tighten clamps, Figure 3.

2. Place leads onto terminals of capacitors as shown in wiring diagram (Figure 10) secure with screws and replace terminal caps.

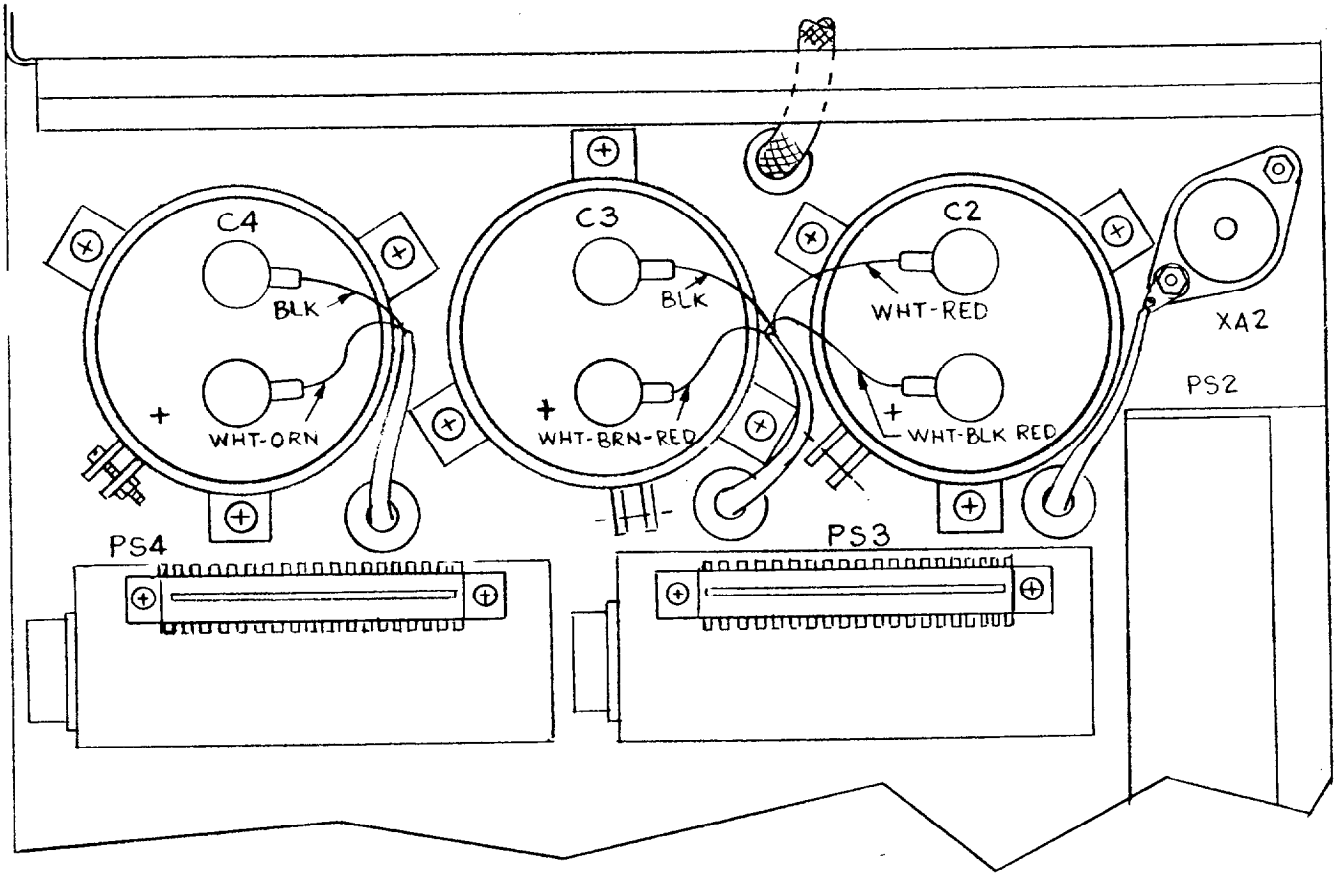



FIGURE 10

G. Install power supplies, Figure 1.

1. Align power supplies on their respective connectors. Press down to be sure they are seated.

2. Secure with power supply mounting screws.

H. Perform the following pre-installation bench check with no cables attached before installing the modified R/ACU into the pedestal.

1. Remove both 4 Amp fuses located on the front panel of the R/ACU. Do not remove the 15 Amp fuse.

2. Using an ohmmeter, verify an open circuit condition (infinite resistance) between each of the following pairs of connector pins. All connections are located on the rear panel of the R/ACU. Refer to Figure 11 for a pin layout of connectors J2 and J5.

| From | To |
|---|---|
| J1-A | J1-B |
| J1-A | J2-g |
| J1-A | J2-q |
| J1-A | J4-D |
| J1-A | J4-E |
| J1-B | J2-g |
| J1-B | J2-q |
| J1-B | J4-D |
| J1-B | J4-E |
| J2-q | J2-g |
| J2-q | J5-m |
| J2-q | J5-r |
| J2-q | J5-n |
| J2-q | J5-p |
| J2-g | J5-r |
| J2-g | J5-n |
| J2-g | J5-p |
| J5-m | J5-r |
| J5-n | J5-p |
| J4-D | J4-E |

3. Using an ohmmeter verify a short circuit (0 ohms) between each of the following pairs of connectors pins.

| From | To |
|---|---|
| J4-E | J4-A |
| J5-m | J2-r |
| J5-r | J2-s |
| J5-b | J2-g |
| J5-q | J2-q |

4. Replace both 4 Amp fuses that were previously removed.

I. Install R/ACU in rack.

1. Install R/ACU 1A3A1 in slides. Make sure that R/ACU is retained by the slide locks.

J. Perform a preliminary electrical checkout to verify normal performance. Any failure to achieve an expected result indicates a probable fault in either wiring or equipment, and must be examined and corrected before continuing the ckeckout procedure.

1. At MCU, disconnect W1 cable (including coax).

2. Turn on "Main Power" to MCU Rack (OK to turn on pedestal power now, if they are connected through a common breaker).

3. Turn on MCU.

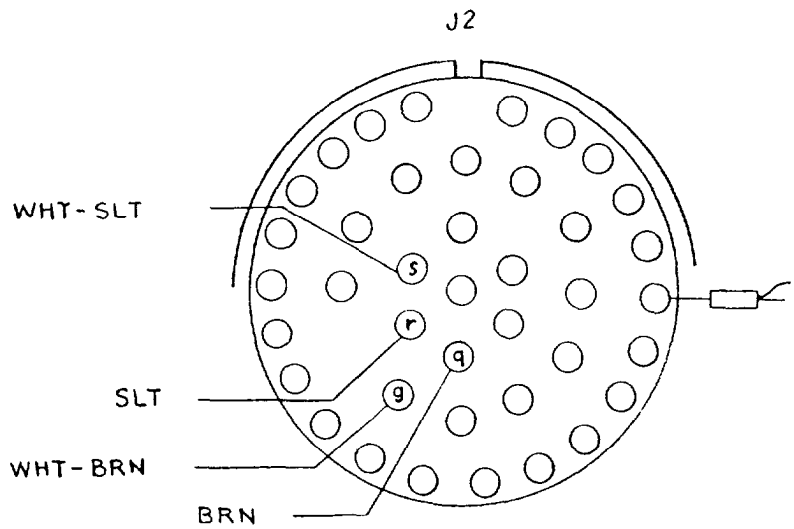
4. Energize pedestal ac power (if not done in step b.)

a. Observe green light on transient protector in the “J” Box is illuminated.

b. Check ac line for 100-130 Vac in J-Box.

5. (WBRT only) using insulated tool, press motor relay at rear of azimuth housing. Motors will run.

6. Connect input power cable J1 to R/ACU. Observe no blown fuses.




**FRONT VIEW**

**FIGURE 11**

**A 12 VDC POWER SUPPLY IS REQUIRED FOR STEPS 7 THROUGH 12. THESE STEPS MAY BE OMITTED IF A POWER SUPPLY IS NOT AVAILABLE, BUT BE ABSOLUTELY CERTAIN THAT THE RELAYS ARE PROPERLY WIRED, A MISTAKE COULD CAUSE EXTREME DAMAGE TO THE R/ACU AND MCU.**

7. Plug 12 Vdc supply into R/ACU service outlet. Set to 12 V.

8. Connect -12 V to chassis via clip lead. Connect +12 V to rear of POWER-ON switch, bottom terminal (6) via clip lead.

9. Turn on R/ACU POWER-ON switch. Observe that some lamps light. Press lamp test (card A10). Observe all lamps are lit except possibly:

   OBSTRUCTION
   OVLD
   STBY*
   OVERRIDE*
   MGC*

   (* Press to light, (if not lit), press to extinguish.)

10. Turn off R/ACU power switch. Connect the appropriate cables to J2 and J5 (leave RNG Unit cable off at J4). Press STANDBY switch once.

11. Turn on R/ACU power switch. Listen for cooling fan hum, Note: STANDBY should be illuminated.

12. Turn off R/ACU power switch. Disconnect 12 V supply. Turn on R/ACU power switch. Power shall not go on.

13. At MCU, verify SYSTEM POWER switch is still off. Connect W1 cable (including coax).

14. Turn on MCU SYSTEM POWER switch, Observe the following lamps light (allow 2 sec). STBY, PWR ON, MAN TRK, MAN SRCH, LO SENS. If STBY is not illuminated, press to illuminate. Observe the SIG LVL meter reads at or near 0. Observe the FREQ METER reads at or near 1680.

15. Observe the Angle Display reads correct angles.

16. Press to illuminate the following (verify STBY is illuminated):

| | |
|---|---|
| NEAR TRACK | (MANUAL EXTINGUISHES) |
| FAR TRACK | (NEAR EXTINGUISHES) |
| FULL SEARCH | (MANUAL EXTINGUISHES) |
| LIM SEARCH | (FULL EXTINGUISHES) |

Press to extinguish LO SENS.

17. Turn off ac power to pedestal (and MCU if they are common). Wait 5 seconds and turn on again. Allow 2 seconds for lamps to stabilize. Observe following lamps are illuminated:

FAR TRACK
LIM SRCH
RADOME POWER FAIL

Observe LO SENS is extinguished. Press to extinguish RADOME PWR FAIL.

18. Press to illuminate MANUAL TRACK.

19. Press to illuminate OVERRIDE.

a. Listen for pylon running.

b. Press to extinguish OVERRIDE.

20. Press to extinguish STANDBY (motors on).

a. Listen for motors starting (WBRT/ART-2).

b. Listen for pylon starting (GMD/ART-1).

21. Set SLEW RATE fully clockwise.

a. SLEW, CW, CCW, UP, DN and observe corresponding action of antenna dish. (Press STANDBY to stop a "runaway")

22. Slew antenna to various positions randomly using both sets of SLEW switches (R/ACU and side of pedestal). Observe for erratic operation which may indicate intermittent connections.

K. Range Unit Checks.

1. Turn off R/ACU power switch. Plug in ranging cable to J4 at back of R/ACU, Turn on R/ACU power switch.

2. Turn on Ranging Unit Power switches. Observe the range unit remains off.

3. At the MOC, turn on RNG PWR switch. Ranging unit should energize.

L. Connect cable assemblies to R/ACU assembly as follows:

| R/ACU Assembly Connector | Cable Assembly Connector | R/ACU Assembly Connector | Cable Assembly Connector |
|---|---|---|---|
| 1A3A1W4J1 | 1A3P1 | 1A3A1W3J5 | 1A3P3 |
| 1A3A1W3J2 | 1A3P2 | 1A3A1W3J6 | W12P1 |
| 1A3A1J3 | W13P1 | 1A3A1J7 | W14P1 |
| 1A3A1W3J4 | W11P1 | | |

M. Secure R/ACU in pedestal assembly using 12 captive screws 1A3A1A5H100 through 1A3A1A5H111.

III. Instruction Manual Changes

Make the following pen and ink changes to the January 30, 1984 issuance of the ART 1 and ART 2 Instruction Manuals, Part III, Parts List:

REF. DES.: 1A3A1K3 DESCR.: Same as 1A3A1K4
MFR. PART NO.: MHY-12D-26.5 VDC
CONTR. PART NO.: 037061001

| 1. ORG | 2. PAY PERIOD (Last day) YEAR MONTH DAY | 3. STATION REG. | 4. AREA SECTOR | 5. INITIALS | 6. HOURLY SALARY | 7. REPORTED BY: | 8. GENERAL PURPOSE |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

WS FORM H-28 (7-77) U. S. DEPARTMENT OF COMMERCE NOAA NATIONAL WEATHER SERVICE

# ENGINEERING PROGRESS REPORT

| SEQ | 9. STATION | REG. | 10. AREA SECT | 11. CATEGORY PROGRAM | 12. WORK TYPE | 13. TOTAL – TIME (Hours) RT | NT | TT | MT | ST | 14. TRAVEL MILES | 15. PER DIEM (Travel wh.$) | 16. COST CODE | 17. COST (Dollars) | 18. ORDER NUMBER | 19. NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | | | | ART1 | MOD | | | | | | | | | | | MOD # 2 ART1 Serial # |
| 1B | | | | | | | | | | | | | | | | Date Modification completed |
| 1C | | | | OR | | | | | | | | | | | | |
| 1D | | | | ART2 | MOD | | | | | | | | | | | MOD #2 ART2 Serial # |
| 1E | | | | | | | | | | | | | | | | Date Modification completed |
| 1F | | | | | | | | | | | | | | | | |
| 1G | | | | | | | | | | | | | | | | |
| 1H | | | | | | | | | | | | | | | | |
| 1I | | | | | | | | | | | | | | | | |
| 1J | | | | | | | | | | | | | | | | |
| 1K | | | | | | | | | | | | | | | | |
| 1L | | | | | | | | | | | | | | | | |
| 1M | | | | | | | | | | | | | | | | |
| N | | | | ADMIN. | | | | | | | | | | | | FOR LEAVE ENTER WORK TYPE: LVA = Annual Leave LVC = Compensatory Leave LVH = Holiday LVS = Sick LVM = Military or Other |
| O | | | | LEAVE | | | | | | | | | | | | |

COST CODES: C = CONTRACTS; T = TRANSPORTATION OF THINGS; P = PURCHASED LOCALLY; G = GOVERNMENT FURNISHED; N = NONCAPITALIZED PROPERTY; M = CAPITALIZED PROPERTY

20. REMARKS

Blocks 1 through 10 must also be filled out.

Enter time required to complete Mod in Col. 13d (MT).

This Mod must be reported into the EMRS System before 30 days following completion of modification

WS FORM H-28 (7-77) SUPERSEDES WS FORMS H-12 AND H-15 WHICH ARE OBSOLETE AND EXISTING STOCKS MAY BE DISPOSED